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Abstract: OBJECTIVE: Substance use treatment is often performed inside locked wards. We investigate the effects of adopting a policy of open-door treatment for a substance use treatment and dual diagnosis ward. METHODS: This is a prospective open-label study investigating 3-month study periods before opening (P1), immediately after (P2), and 1 year after the first period (P3). Data on committed patients, coercion (seclusion, forced medication, absconding events with subsequent police search), violence, and substance use was collected daily. We applied generalised estimating equation models. RESULTS: The mean daily number of patients with ongoing commitment changed from 2.64 (P1) to 2.12 (P2) to 0.96 (P3), corresponding to a reduction of relative risk (RR) for having an ongoing commitment by 20% in P2 (RR 0.80; 95% CI 0.66-0.98) and 67% in P3 (RR 0.33; 95% CI 0.25-0.42). The mean daily number of coercive events was 0.29, 0.13, and 0.05, corresponding to a risk for undergoing coercive measures reduced by 56% (RR 0.44; 95% CI 0.22-0.90) and 85% (RR 0.15; 95% CI 0.05-0.45). Substance use, violence or ward atmosphere did not differ significantly. CONCLUSIONS: Our results support findings from general psychiatric wards of reduced coercion after adopting a primarily open-door policy. However, coercive events were rare during all periods. The widespread practice of restricting the freedom of inpatients with substance use disorders by locking ward doors is highly questionable.

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Effect of Door-Locking Policy on Inpatient Treatment of Substance Use and Dual Disorders

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Keywords
Locked doors · Coercion · Seclusion · Absconding · Ward atmosphere · Comorbidity

Abstract
Objective: Substance use treatment is often performed inside locked wards. We investigate the effects of adopting a policy of open-door treatment for a substance use treatment and dual diagnosis ward. ***Methods:*** This is a prospective open-label study investigating 3-month study periods before opening (P1), immediately after (P2), and 1 year after the first period (P3). Data on committed patients, coercion (seclusion, forced medication, absconding events with subsequent police search), violence, and substance use was collected daily. We applied generalised estimating equation models. ***Results:*** The mean daily number of patients with ongoing commitment changed from 2.64 (P1) to 2.12 (P2) to 0.96 (P3), corresponding to a reduction of relative risk (RR) for having an ongoing commitment by 20% in P2 (RR 0.80; 95% CI 0.66–0.98) and 67% in P3 (RR 0.33; 95% CI 0.25–0.42). The mean daily number of coercive events was 0.29, 0.13, and 0.05, corresponding to a risk for undergoing coercive measures reduced by 56% (RR 0.44; 95% CI 0.22–0.90) and 85% (RR 0.15; 95% CI 0.05–0.45). Substance use, violence or ward atmosphere did not differ significantly. ***Conclusions:*** Our results support findings from general psychiatric wards of reduced coercion after adopting a primarily open-door policy. However, coercive events were rare during all periods. The widespread practice of restricting the freedom of inpatients with substance use disorders by locking ward doors is highly questionable.

Introduction

The debate about the appropriate setting for substance use treatment, especially whether it should be performed in open or locked conditions, stretches back to the late 19th and early 20th centuries [1–3]. A paternalistic or

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even custodial attitude is still prevalent and acute inpatient treatment often performed on locked wards [4]. The American Psychiatric Association guidelines advocate treatment on locked wards for patients with substance use disorders battling with "poor impulse control," or "…co-occurring psychiatric conditions whose clinical state would ordinarily require such a unit…" [5]. Underlying reasons vary from fear of absconding, import of psychoactive substances, anticipated relapse and failure to complete detoxification, or protection of patients from potential drug cue-related stimuli, which may induce craving. However, there is no evidence to support this policy and there have been calls for a reduction in the number of closed psychiatric wards, for example, by the Ethics Committee of the German Chamber of Physicians [6].

There is growing evidence from general psychiatric wards that while locked doors do not reduce absconding, dangerous events or suicide risk [7, 8], the introduction of an open ward policy can reduce coercive measures like seclusion [9] and involuntary medication [10], and aggressive incidents [11]. There is lack of research on the effects of a locked-door policy on substance use. Bowers et al. [12] surveyed 133 acute psychiatric wards and found no association of exit security or locking of the ward door with substance use. However, it has to be kept in mind that the above studies focussed on general psychiatric wards rather than specialised substance use or dual diagnosis units.

Patients have been shown to experience feelings of distress such as aggression, anger, irritation, depression and low self-esteem during treatment on a locked acute psychiatric ward [12, 13]. Haglund and von Essen [14] showed that locked doors may evoke feelings of confinement, forced dependence on staff or negative emotions in voluntarily admitted inpatients. By staff and patients alike, locked wards may be perceived as an uncaring and stigmatising environment [13–15]. In psychotic patients who were admitted for the first time, 80% described treatment as traumatic and 38% were diagnosed with post-traumatic stress disorder associated with admission [16]. A German study found that admission to an open ward was associated with a more positive experience than admission to a locked ward [17]. Furthermore, opening and locking doors may increase the workload for nurses and reduce time for engagement in therapeutic activities with patients [13, 14, 18].

Institutional factors such as a locked-door policy may thus create a stressful environment with uncertain consequences on the outcome of substance use treatment. Stress is pivotal in the development of substance use disorders [see 19, for a review]. Moreover, it has been shown to be associated with craving and with the outcome of substance use treatment, for example, relapse [20, 21]. Furthermore, locked doors may have effects on therapeutic alliance [22], ward atmosphere [23] and psychiatric symptoms, which are also closely related to stressful experiences.

Aims of the Study

We aim to investigate the effect of making a shift from a policy of locked doors to a primarily open door strategy on an acute substance use treatment and dual diagnosis ward. As such a change constitutes a long-term process, entailing alterations in staff attitude and daily routines, we chose to evaluate 3 study periods with a respective duration of 3 months: before (period 1), immediately after (period 2), and 9 months after opening (period 3) the doors of an acute substance use treatment ward. Our general hypothesis was that differences between study periods would be most pronounced comparing periods 1 and 3, but the direction of change would already be visible comparing periods 1 and 2. Concerning outcome parameters, we hypothesised a reduction in the daily number of patients with ongoing commitment, number of coercive measures, and violent incidents. We also assumed that craving and substance use events would decrease, and ward atmosphere as conceived by staff would improve.

Methods

Design

We conducted an open-label study in a clinical setting. Measurements were taken over 3 periods: the 3 months preceding the change of policy (period 1, February 1 to May 1, 2013, 90 days), the 3 months following the change (period 2, May 2 to July 31, 2013, 91 days), and the 3-month-period 9–12 months after, corresponding to the same time of year as the period 1-interval (period 3, February 1 to April 30, 2014, 89 days).

Setting

The University Psychiatric Clinics (UPK) of Basel provide treatment for a population of 195,000 in the canton of Basel-City. There are no other facilities in the catchment area admitting patients committed for treatment of mental illness, and police or medical transport automatically bring all committed patients to this hospital. Besides a number of specialised wards like psychotherapeutic or gerontopsychiatric units, in the year 2013, there were 5 general psychiatric wards and 3 specialising in substance use treatment. Patients with substance use disorders are generally treated on the latter and admission to one of the other wards is the exception in case substance use wards are overcrowded. Patients are then transferred to substance use units as soon as possible. Of the 3 substance use wards, 2 were permanently open and specialising on alcohol or sedative withdrawal, or rehabilitational treat-

ment respectively. The third substance use ward is the one under study. It specialises on acute treatment of substance use disorders, of which most are heroin, cocaine, alcohol or amphetamine related, and dual disorders, such as schizophrenia, bipolar disorder, unipolar depression, disorders of posttraumatic stress and personality disorders. A maximum of 17 patients can be treated at a time. Entry modalities encompass planned as well as emergency admissions referred by a physician, the authorities or the patient himself or herself. In order to ensure reimbursement through basic health insurance, it is mandatory in Switzerland that inpatient treatment is performed in the home canton. There is no other treatment institution in the canton of Basel-City offering inpatient substance use treatment.

There are 2 seclusion rooms for patients who are at risk of harmful behaviour to others. No physical restraint is used. Acutely suicidal patients are usually treated in a one-on-one manner by a psychiatric nurse. Following a strategic decision of hospital management, the ward adopted a policy of partial open-door treatment on May 2, 2013. Since then, ward doors are principally open with the option of closure only when it is deemed necessary. No structural or conceptual changes other than the door policy were established during the time of study. Only the 2 rotating resident physicians changed between study periods 2 and 3. Otherwise, there were no major staff changes between study periods, and notably the senior physician and the head nurse remained the same.

Procedures

Routine ward procedures included a thorough search of patients' belongings in their presence at admission to avoid import of psychotropic drugs, which were discarded without reporting to the authorities. Medication was stocked away and returned at discharge. Substance use was screened for by urinalysis and breathalyser testing at the time of admission, breathalyser testing on return from leave, and whenever suspected. Furthermore, during this study, additional urinalysis was performed weekly on a randomised day unknown to patients and staff beforehand.

Doors were not controlled in a specific way regardless of the locking status. Patients had individual arrangements for leaving the ward and these arrangements were determined during visits by physicians and nurses in cooperation with the patient. Sometimes patients were asked to stay on the ward, in particular during the first day of inpatient treatment, but this was not explicitly controlled. Patients indicated their current whereabouts (e.g., ward, therapy, garden, and home) on a magnetic board on the ward. Having a committed patient on the ward did not automatically lead to locking of the doors, and depending on their arrangement, committed patients could also be allowed to leave the ward. However, committed patients were informed that a police search would be initiated after a specified time period in case they absconded.

Data was assessed by anonymised extraction from electronic patient files and a daily protocol completed by staff during daily team meetings. Furthermore, the staff completed the Essen Climate Evaluation Schema (EssenCES) once per study period.

Available routine data from the electronic patient file comprised the following items: age, gender, psychiatric disorders (ICD-10 codes), substance use (urinalysis results at admission and randomly once per week during hospitalisation), duration of inpatient stay and details on the circumstances of admission and discharge. Furthermore, it included psychiatric symptoms as part of the nationwide quality assessment for psychiatric hospitals. These were assessed with the German version of the Brief Symptom Checklist (BSCL) [24], a 53-item questionnaire yielding 9 dimensional scales and 3 global indices. It takes about 8–10 min to complete and is distributed to the patients within 3 days after admission and before discharge. However, only patients with sufficient language skills and who were hospitalised for at least 72 h are approached for completion of this scale. This contributed to a large number of missing values for BSCL scores (57.4% for global scores at admission and 69.3% at discharge).

In the daily protocol, staff recorded data on the number of inpatients and of patients with ongoing commitments on the ward (commitment can be stopped by the senior physician when the underlying condition is improved or the patient decides to stay on a voluntary basis), the number of patients with substance use events identified by urinalysis, breathalyser and/or reported by staff or patients, door-locking status and coercive measures (seclusions, forced medications, absconding events with subsequent police search, and one-on-one treatment episodes). It is controversial whether one-on-one-treatment should be defined as a coercive measure. On the one hand, the patient may be accepting of such an intervention, and it is usually neither related to the application of force nor the restriction of movement. On the other hand, it clearly represents a restriction of privacy. Therefore, we calculated 2 index scores for coercive measures by summing up the number of seclusions, forced medications and absconding events with subsequent police search per day, one including and one excluding one-on-one treatment episodes. Displaying both index scores permits the evaluation of the effect of using either definition. Aggressive or violent incidents were also recorded and assessed in 4 categories adapted from the Brøset-Violence-Checklist (BVC) [25]. The BVC was originally developed in Norway and has been validated in German. It was applied in a variety of studies assessing violence and coercive measures in mental health settings. It can be used to predict the risk of imminent violence by assessing the presence of several types of aggressive or violent behaviour. Ward personnel reported the daily frequency (never = 0, once = 1, more than once = 2) of verbal threats, physical threats, attacks on objects and attacks on people. We calculated an index score for aggressive incidents by summing the scores per day.

Ward atmosphere as perceived by ward staff (nurses, physicians, psychologists) was measured with the EssenCES. This is a 17-item questionnaire, 15 of which are used to calculate a global score and 3 subscores (therapeutic hold, i.e., the level to which ward atmosphere is perceived to be helpful for patients' needs; patients' cohesion and mutual support; and experienced safety, that is, the extent of perceived tension and risk of aggressive or violent incidents on the ward). Each item is scored on a 5-point Likert scale, 6 items are scored in reverse. The EssenCES was developed by Schalast [26] in 2008 and has been validated and used to measure social climate in mental health settings in a variety of studies in Germany, Switzerland, and the United Kingdom.

The study was approved by the local Ethics Committee (study number 54/13). All procedures were conducted in accordance with the Declaration of Helsinki.

Statistical Analyses

All statistical analyses were done with SPSS version 18.0 for Windows and SAS 9.3. To analyse differences in routine data and EssenCES scores between study periods, we used analysis of variance (ANOVA) for continuous variables and chi-square tests for

categorical variables. We applied generalised estimating equation (GEE) with the logarithm of the daily number of patients as offset and Poisson distribution using PROC GENMOD in SAS 9.3 with 2 indicator variables (periods 2 and 3, respectively) by using (1) number of patients with ongoing commitment, (2) index score for coercive measures without one-to-one treatment episodes, (3) index score for coercive measures including one-to-one treatment episodes, (4) number of patients with substance use events over the last 24 h, and (5) aggression score. If there were indications for overdispersion, we also applied a model with negative binomial distribution instead of Poisson distribution and chose the model with the lower Bayesian information criterion. Effects are also presented as relative risks (RRs) indicating the decrease in the mean score during an average day during the respective period.

Results

Door-Locking Status

After change of the door policy, the ward was completely open on 58.2% of days in period 2 and 67.4% of days in period 3. Doors were open for part of the time on 26.4 and 19.1% of days, respectively. The ward was continuously locked for 100% of days in period 1, and 15.4 and 13.5% in periods 2 and 3, respectively.

Routine Data

Overall, 329 cases were treated in the ward during the study periods (period 1: $n = 113$, period 2: $n = 125$, period 3: $n = 91$). There were no significant differences between baseline and follow-up periods for mean age, gender, nationality, committed admissions, admission modality (emergency vs. elective), residence before admission, initiation of hospitalisation, commitment at admission, main diagnosis leading to hospitalisation, proportion of patients with psychosis, decision for discharge, discharge modality, residence after discharge, or treatment after discharge. The only routine parameter showing significant differences was the mean duration of inpatient stay, which was shortest during the summer period 2 (Table 1).

ANOVAs revealed no difference in global symptom scores of the BSCL at the time of admission (1.15, 1.15, and 1.18 for periods 1, 2, and 3, respectively; F = 0.016; $p = 0.984$), or discharge (0.68, 0.67, 0.86 for periods 1, 2, and 3, respectively; F = 0.783; $p = 0.460$), indicating that patients had a similar symptom burden between study periods. There were also no significant differences for the subscores of the BSCL at admission or discharge, or in change of BSCL global score during treatment (data not shown), with limited interpretability due to high percentage of missing data.

Coercion, Aggression and Substance Use

The daily staff protocol on coercion, violent incidents and substance use events was completed on 92% of days in period 1, 95% in period 2 and 90% in period 3. The number of coercive events was low throughout all 3 periods. The mean daily number of patients with ongoing commitment changed from 2.64 (period 1) to 2.12 (period 2) to 0.96 (period 3). The mean daily number of coercive events decreased from 0.29 to 0.13 to 0.05, and 0.33 to 0.19 to 0.06 when including one-on-one-treatments. Results are displayed in Table 2.

Table 3 shows GEE results of patients with ongoing commitment, number of coercions and patients with substance use events (i.e., "lapse/relapse"). In both periods with primarily open doors, the daily proportion of patients with ongoing involuntary commitment was significantly lower than during the period with closed doors: compared to period 1, the RR during period 2 was 0.80 (95% CI 0.66–0.98) and even lower during period 3 (RR 0.33; 95% CI 0.25–0.42). The coercion index was significantly lower in period 2 (RR 0.44; 95% CI 0.22–0.90) and particularly in period 3 (RR 0.15; 95% CI 0.05–0.45). This corresponds to a risk reduction for experiencing coercion by 85% during period 3 compared to period 1. When including one-on-one treatments as a coercive measure in the index, the difference was significant only during period 3. Although the number of patients with substance use events was slightly lower during period 2 (RR 0.90; 95% CI 0.46–1.75) and period 3 (RR 0.78; 95% CI 0.40–1.53), these effects were not significant. The same holds true for the index of violent or aggressive incidents (period 2: RR 0.62; 95% CI 0.30–1.30; period 3: RR 0.52; 95% CI 0.25–1.11).

Ward Atmosphere

Ward atmosphere as perceived by staff was assessed with the EssenCES (Table 4). Of 22 staff members, 17 (77%) completed the EssenCES in period 1, 12 (55%) in period 2 and 15 (68%) in period 3. While mean values increased for the total score as well as for all subscales from period 1 to period 3, this increase did not reach significance.

Discussion

To our knowledge, this is the first study evaluating the effects of moving from a policy of permanently locked doors to a primarily open one on an acute substance use

Table 1. Routine data for the 3 study periods

	Permanently locked doors, period 1 (n = 113), %[1]	Primarily open, period 2 (n = 125), %[1]	Primarily open, period 3 (n = 91), %[1]	Significance, p value[2]
Age at admission, years, mean (SD)	40.2 (9.8)	40.6 (10.6)	40.7 (10.2)	0.937
Gender				
Female	27.4	36.0	23.1	0.101
Nationality				
Swiss	66.4	70.4	75.8	0.338
Other	33.6	29.6	24.2	
Duration of inpatient treatment, days, mean (SD)	23.1 (25.1)	16.0 (20.4)	18.9 (19.8)	**0.047**
Admission modality				
Emergency	70.8	74.4	67.0	0.496
Elective	29.2	25.6	33.0	
Residence before admission				
Living alone	37.2	36.8	34.1	0.446
With others	25.7	36.8	31.9	
Residential home	8.8	8.0	8.8	
Acute somatic hospital	7.1	8.0	6.6	
Homeless	11.5	4.8	13.2	
Other/unknown	9.7	5.6	5.5	
Initiation of hospitalisation				
Self/relative	43.4	42.4	49.5	0.601
Ambulance/police	21.2	24.0	15.4	
Physician/psychologist	32.7	29.6	34.1	
Other (including legal authorities)	2.7	4.0	1.1	
Committed admission	14.2	15.2	6.6	0.133
Main diagnosis, ICD-10 category				
Alcohol use disorder (F10)	41.6	51.2	45.1	0.898
Opioid use disorder (F11)	20.4	17.6	22.0	
Cannabis use disorder (F12)	4.4	3.2	1.1	
Sedative use disorder (F13)	5.3	3.2	1.1	
Stimulant use disorder (including cocaine, F14, F15)	11.5	10.4	9.9	
Schizophrenic spectrum (F2)	7.1	6.4	8.8	
Affective disorders (F3)	4.4	3.2	5.5	
Other (F0, F4, F6)	5.3	4.8	6.6	
Comorbid psychotic symptoms (comorbid diagnosis F20, F1x.5, F30.2, F31.2)	17.7	20.0	19.8	0.889
Decision for discharge				
Mutual consent	67.3	57.6	58.2	0.420
Initiation by ward team	4.4	4.0	5.5	
Initiation by patient	26.5	38.4	35.2	
Other	1.8	0.0	1.1	
Discharge modality				
External	77.0	77.6	85.7	0.237
Transferred to other ward	23.0	22.4	14.3	
Residence after discharge				
Living alone	43.4	37.6	35.2	0.242
With others	24.8	38.4	29.7	
Residential home/therapeutic community/ assisted accomodation	10.6	10.4	19.8	
Hospital (acute somatic care, psychiatric, rehabilitational)	3.5	4.0	5.5	
Homeless	6.2	2.4	4.4	
Other/unknown	11.5	7.2	5.5	
Treatment after discharge				
Outpatient care	85.0	87.2	89.0	0.553
Inpatient care	7.1	5.6	4.4	
Rehabilitation (outpatient or inpatient)	5.3	1.6	2.2	
Other/unknown	2.7	5.6	4.4	

[1] % of respective period; [2] p value from chi-Square test or ANOVA. Significant values in bold.

Table 2. Ongoing commitment, coercion, substance use events and violent incidents

	Permanently locked doors, period 1	Primarily open, period 2	Primarily open, period 3
Daily number of patients on the ward, mean (SD)	14.66 (2.04)	14.69 (1.91)	16.51 (1.33)
Daily number of patients with ongoing commitment, mean (SD)	2.64 (0.90)	2.12 (1.37)	0.96 (0.78)
Number of forced medications during period, sum	4	1	0
Number of seclusions, sum	11	3	3
Number of abscondings with subsequent police search, sum	9	7	1
Coercion index[1], mean (SD)	0.29 (0.57)	0.13 (0.37)	0.05 (0.22)
Number of one-on-one treatments, sum	3	6	1
Coercion index including one-on-one treatments[2], mean (SD)	0.33 (0.60)	0.19 (0.48)	0.06 (0.24)
Days with substance use events (lapse/relapse), *n* (%)	28 (34)	18 (21)	19 (24)
Number of patients with substance use events (lapse/relapse), sum	35	32	32
Physical threat, *n* (% of days)			
None	72 (87)	79 (92)	76 (95)
Once	3 (4)	2 (2)	2 (3)
Several times	8 (10)	5 (6)	2 (3)
Verbal threat, *n* (% of days)			
None	60 (72)	68 (79)	65 (81)
Once	9 (11)	7 (8)	9 (11)
Several times	14 (17)	11 (13)	6 (8)
Attacks on objects, *n* (% of days)			
None	72 (87)	81 (94)	71 (89)
Once	3 (4)	2 (2)	5 (6)
Several times	8 (10)	3 (4)	4 (5)
Attacks on people, *n* (% of days)			
None	77 (94)	85 (99)	77 (96)
Once	5 (6)	0	1 (1)
Several times	0	1 (1)	2 (3)

[1] Coercion index calculated by summing up the daily number of seclusions, forced medications and absconding events with subsequent police search.
[2] Calculated by summing up the daily number of seclusions, forced medications, absconding events with subsequent police search and one-on-one treatments.

Table 3. Results of generalised estimating equation of patients with ongoing commitment, number of coercions, and patients with substance use events

	Ongoing commitment	Coercion index[1]	Coercion index including 1:1 treatments[2]	Patients with substance use events	Aggression[3]
Intercept (SE)	–1.78 (0.07)***	–3.99 (0.2)***	–3.87 (0.19)***	–3.54 (0.24)***	–2.79 (0.26)***
Period 2 (SE)	–0.22 (0.1)*	–0.82 (0.36)*	–0.52 (0.32)	–0.11 (0.34)	–0.47 (0.37)
Period 3 (SE)	–1.12 (0.13)***	–1.87 (0.54)***	–1.76 (0.49)***	–0.25 (0.34)	–0.65 (0.38)
Dispersion	–	–	–	2.34 (0.68)	4.49 (0.88)
RR period 2 (95% CI)	**0.80 (0.66–0.98)**	**0.44 (0.22–0.9)**	0.59 (0.32–1.1)	0.90 (0.46–1.75)	0.62 (0.3–1.3)
RR period 3 (95% CI)	**0.33 (0.25–0.42)**	**0.15 (0.05–0.45)**	**0.17 (0.07–0.45)**	0.78 (0.40–1.53)	0.52 (0.25–1.11)
Number of observations	241	249	246	245	248
Deviance	199.1	146.1	166.2	164.5	155.3
DF	238	246	243	242	245
Fit (deviance/df)	0.84	0.59	0.68	0.68	0.63
BIC	746.3	232.4	266.2	436.8	539.8

SE, standard error; RR, relative risk; df, degree of freedom; BIC, Bayesian information criterion.
* $p < 0.05$; *** $p < 0.001$. Significant values in bold.
[1] Coercion index calculated by summing up the daily number of seclusions, forced medications and absconding events with subsequent police search.
[2] Calculated by summing up the daily number of seclusions, forced medications, absconding events with subsequent police search and one-on-one treatments.
[3] Sum of daily items recorded on the ward with the adapted Brøset violence checklist.

Table 4. Total score and subscores of the Essen-Climate Evaluation Scale completed by personnel

	Permanently locked doors, period 1 (n = 17)	Primarily open, period 2 (n = 12)	Primarily open, period 3 (n = 15)	Significance[1]
Patients' cohesion and mutual support	10.2 (3.2)	10.4 (3.3)	10.8 (2.4)	0.84
Experienced safety	7.0 (4.6)	8.7 (4.9)	10.5 (4.7)	0.12
Therapeutic hold	15.5 (3.1)	15.8 (3.1)	16.7 (1.5)	0.46
Total score	32.7 (7.8)	34.8 (7.2)	37.9 (6.5)	0.13

[1] p value from ANOVA.

treatment and dual diagnosis ward. Our results are highly relevant in light of the high number of patients in psychiatric institutions using substances. After the policy change, the studied ward was open on more than 4 out of 5 days, underlining that the open door approach is feasible in acute substance use and dual diagnosis treatment. As hypothesised, all effects were more pronounced during the third study period, that is, 9 months after opening the doors compared to the second study period, which is immediately after opening the doors. This finding indicates that, when moving from a locked- to an open-door setting, the entailed changes evolve over a longer period of time.

Our results support findings from general psychiatric wards on the effects of structural transformation from locked- to open-ward settings. Steinert et al. [27] reported a significant decrease of coercive measures and violent incidents after the implementation of a specialised open ward for personality disorders and adjustment disorders. Lang et al. [7] investigated treatment changes during 6 months before and after moving to a primarily open setting on an acute general psychiatric ward and observed a reduction in the number of forced medications, absconding events and aggressive incidents, and an increased time to readmission. In our clinic, we found a reduction in the number of seclusions on a hospital-wide level after opening the doors of 2 previously locked wards, not identical with the one studied here [9].

While our findings are somewhat limited by the generally low frequency of coercive events throughout all 3 study periods, several explanations are conceivable for the decrease in coercive measures that we observed. Patients may feel less confined, distressed and stigmatised in an open-door setting [14, 18, 28]. This may be particularly true for patients with dual diagnosis [29]. Moreover, the opening of a ward may reduce the pressure resulting from overcrowding, which is associated with the frequency of violent incidents [30, 31]. Ward occupancy was highest during period 3, further supporting such a mechanism. Attitudes and burnout of nursing staff predict aggressive incidents on closed psychiatric units [32] and nurses working on open compared to locked wards have higher work satisfaction [33]. Staff mentioned that the time spent on opening and closing the doors during locked periods was freed for other activities such as patient contact during open periods. All of these factors may lead to a reduction in aggressive behaviour and reactive coercion. However, while we did observe a reduction in the number of violent incidents, this effect did not reach significance. We think that continuing the numerical change observed in our study, there might be an ongoing development leading to a further reduction in aggressive incidents as observed in prior studies. Longer-term changes in staff attitude towards patients, improvements in therapeutic relationship and shared decision making are likely to play a role in this development. Future research should evaluate staff attitude to further clarify the effect of changing to an open-door setting.

We found evidence for a reduction in the number of patients with ongoing commitment and an increase in the number of voluntarily treated patients on the ward, and this was also found to be the most pronounced during the third study period. The risk of having a status of ongoing commitment decreased by two thirds across study periods. In Basel, psychiatric patients are committed to inpatient treatment by public health officers who are independent of the clinic. It is therefore unlikely that the structural opening affected their practice of committing patients. We can also rule out that committed patients were allocated to other facilities, as our hospital is the only psychiatric institution offering treatment for committed patients in the catchment area. However, a patient is never committed if he or she consents to voluntary treatment. Patients may be more likely to consent to inpatient treatment when they know the unit is open.

Such an effect would be expected to occur with some delay after the opening of the ward, until patients become aware of the structural change. Our findings support this notion, as the proportion of committed patients at admission was similar in the first 2 study periods and somewhat lower in the third, although this finding did not reach significance. If, during inpatient treatment, a committed patient consents to treatment, the ongoing commitment can be stopped by the responsible physician and the patient switches to voluntary status. Our results illustrate that patients may have been more likely to consent to the initiated treatment on an open ward during both periods with open doors. Unfortunately, we did not directly assess the number of patients who were committed initially and consented to treatment during their stay. As perceived coercion is harmful for therapeutic alliance [22], a voluntary treatment status may be beneficial.

The reduction of treatment duration during the open-door periods was a somewhat unexpected finding, as we anticipated an increase. A recent review demonstrated an association of coercive measures, aggression and agitation with an increased length of stay in adult psychiatric care [34]. The reduction of coercion (significant) and aggression (not significant) in our study may therefore be the underlying reason for the decrease in treatment duration. The reduction may also reflect a less restrictive and custodial staff attitude. Alternatively, achieving treatment goals may be easier and quicker with patients consenting to treatment, and a working therapeutic alliance with improved shared decision making.

Critics sometimes assign the generally favourable results of studies on the opening of psychiatric wards to a shift of more severely ill patients to locked wards in the same hospital or elsewhere. We believe that such an effect is highly unlikely in our study for several reasons. First, there is no locked ward in the hospital offering acute substance use treatment, and the only other locked ward was a general psychiatric unit that was opened in a similar manner during the same time. Second, mandatory basic healthcare insurance in Switzerland only covers treatment in the canton of residency, and there is no other psychiatric hospital offering inpatient substance use treatment in the canton of Basel-City. Third, psychiatric symptom severity as measured by the BSCL was similar across all 3 study periods, a finding that is somewhat limited by missing data.

Substance use is among the reasons for a locked-door status mentioned by psychiatric staff. In a 2007 survey, more than a 4th of 193 Swedish ward managers believed that locking doors would prevent substances from being smuggled onto the unit [4]. In the same study of 21 surveyed substance use units, none had an open door when a committed patient was present. A qualitative study interviewing British nurses also found that the prevention of substance use is an important part of the rationale for locking doors [35]. We did not find evidence for an increase in substance use. According to our study hypothesis, we even anticipated a reduction of substance use due to a decrease of stress and as a consequence a decrease in the craving for substance use. However, this was also not the case. Our result is in line with literature on general psychiatric wards suggesting that door-locking status has no effect on substance use [12]. It may be argued that substance use may be less controllable after the opening of the doors of the ward and substance use events therefore recorded less often. However, by conducting weekly urinalysis for all patients on a randomised day unknown to patients and staff beforehand, we even intensified control compared to routine procedures on the ward. We also believe that moving away from a custodial and controlling attitude to a more patient-centred approach in substance use treatment will enable patients to more freely self-report their substance use, and thus work on it more effectively.

Finally, we hypothesised an improvement of ward atmosphere perceived by staff, as the opening of ward doors liberates time for patient-centred activities, as opposed to opening and locking of doors. Such an improvement has also been described in the literature [23]. However, ward atmosphere did not change significantly, although the corresponding EssenCES scores were highest in period 3 and lowest in period 1. However, the number of staff members is not large, and not all of them completed the questionnaire, thereby limiting the statistical power.

Our study has several limitations. The 3-month duration of study periods may have been too short to identify significant differences in substance use and aggressive incidents. Furthermore, the number of coercive measures was very low throughout all 3 periods. We also may have underestimated substance use events due to the use of qualitative urinalysis with limited ability to detect changes of substances and metabolites with long presence in urine, such as THC, methadone or certain benzodiazepines. However, this would have affected all 3 study periods in an equal manner. Among the strengths of our study is the prospective design with daily assessment of coercion and substance use.

Moving to a less restrictive door policy on an acute substance use and dual diagnosis ward is feasible and is associated with a reduction in coercive measures and an increase in the daily number of patients with voluntary treatment status as opposed to ongoing commitment. There was no significant change in substance use. The widespread practice of restricting the freedom of inpatients with substance use disorders by keeping ward doors locked continuously is highly questionable.

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Disclosure Statement

None of the authors have any conflicts of interest to declare.

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